

With the great activity of the Aleutian cyclone and the increasing number of lows entering the upper Pacific from Asia, trans-Pacific steamships experienced rougher weather generally than during any month since February or March. On the northern routes, between longitudes 155° W. and 160° E., gales were reported on 15 to 30 per cent of the days. Many of these were of force 10, and full storm winds were reported on the 19th near 49° N., 175° E.; on the 22d, near 43° N., 155° E.; on the 26th, near 42° N., 160° W.; and on the 31st, near 51° N., 156° W. In addition, hurricane velocities occurred on the 9th near 51° N., 167° E. Along the American coast gales were reported off California on the 28th; off Vancouver Island on the 8th and 12th; and in Alaskan waters on the 4th, 9th, 23d, and 31st. One of the most interesting storm developments of the month was that which appeared as a slight depression near Midway Island on the 25th. It apparently joined with another depression from the northwest on the 26th and rapidly deepened into an intense storm, at which time it was experienced by the American steamship *Golden Star*, Capt. O. Lee, Hong Kong to San Francisco. The observer, Mr. P. A. Caldwell, reported that "at 4 p. m. wind hauled to ENE., force 8, barometer 28.70, wind gradually decreasing. Between 5 and 6 p. m. wind was calm. Lowest barometer reading at this time was 28.66; then at about 6 p. m. wind hauled to NNW., 6-8. Engines put on half speed account of heavy seas. At 8 p. m. wind increased to force 11." This is one of the few instances we have of seamen reporting a calm in the center of an extratropical cyclone.

Of the typhoons mentioned by the Rev. José Coronas in the subjoined article, reports from our marine observers show that several vessels were more or less heavily involved in two or more of these tropical storms. The following may be mentioned because of the higher winds encountered:

The American steamship *Golden Star*, Hong Kong to San Francisco, ran into northeasterly gales of force 8 on the 8th near 23° N., 124° E. On the 9th the wind hauled into north and increased to force 9. On the 10th, near 23° N., 129° E., immediately to the westward of the typhoon center, the vessel experienced hurricane velocities from the northwest, lowest pressure 28.92. These continued from 4 a. m. until noon, after which there was a slow moderation.

The Japanese steamship *Ishin Maru*, Capt. G. Yoshihira, second officer and observer, Mr. N. Obori, Miike to Astoria, in a special report to the Hydrographic Office, is shown to have encountered hurricane winds generally from midnight of the 25th until noon of the 26th, her noon position being in 32° 23' N., 134° 29' E., lowest pressure 29.10 inches, from 10 to 11 a. m., between which hours she was becalmed in the "eye" for 30 minutes. She entered the storm area on the 25th, with gales ranging in force from 8 to 11, and left it on the evening of the 26th.

The Norwegian motor ship *Jara*, San Pedro to Yokohama, furnished a special report, with drawings, of her experience in the Japanese typhoon of the 26th-27th. On the 26th she ran into whole gales from south-southwest in about 36° N., 142° E. At 2 a. m. of the 27th the hurricane was at its height, barometer down to 29.40. The wind continued at force 12 until 10 a. m., after which it began to moderate. The observer calculated the radius of the typhoon to be 200 miles and the speed between 15 and 20 nautical miles an hour.

On account of the increasing number of continental anticyclones advancing upon the China coast, the northeast monsoon was strong on several days, particularly in

the Taiwan Channel and northward therefrom. It was at times accentuated by the northerly winds of the tropical storms passing by to the eastward.

No cyclones appear to have formed in Mexican waters, but on several days, including the 4th, 8th, 12th, 22d, and 24th, moderate to fresh northers were encountered by vessels in and south of the Gulf of Tehuantepec.

The prevailing wind at Honolulu was from the east, and the next most frequent was from the northeast. The maximum velocity was at the rate of 22 miles an hour from the east on the 5th.

Although fog is comparatively infrequent on the open North Pacific during October, it formed on fewer days than usual this month, and was absent, according to available reports, except on the 7th and 9th, to the westward of longitude 150° W. Between that meridian and longitude 130° W. it was observed on a few days toward the end of the month, but along the coast of the United States from 20 to 30 per cent of the days had fog off Washington and Oregon and nearly 50 per cent had fog within 200 miles or less of San Francisco. Below Point Conception the percentage decreased rapidly to Point Eugenia, Lower California, where fog ceased. On the 13th the Canadian liner *Empress of Canada* grounded in Homer Bay, Straits of Juan de Fuca, during a dense fog, and was not floated until the 15th. Her passengers meanwhile were transferred safely to another steamship, the *Otter*, and landed at Victoria.

TYPHOONS AND DEPRESSIONS—FIVE DEPRESSIONS OR TYPHOONS OVER THE FAR EAST IN OCTOBER, 1929

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There were three very well developed and severe typhoons and two others of less importance over the Far East during the last month of October. None of them, however, touched the Philippines, but four remained in the Pacific and one entered Indo-China.

The first of the Pacific typhoons appeared on our weather map at 6 a. m. of the 4th near 145° longitude E. and 10° latitude N. It moved northwest on the 4th, and at 6 a. m. of the 5th it began to move W. or W. by N., threatening the Philippines; but in the afternoon of the 7th and during the 8th it turned to the NW. and N. On the 11th it recurved to ENE. near the northern Loochoos, and then it filled up soon on the 12th to the south of Japan.

The approximate position of the center at 6 a. m. of the period October 4 to 12 was as follows:

October 4, 6 a. m.,	144° 45' longitude E.,	9° 45' latitude N.
October 5, 6 a. m.,	141° 20' longitude E.,	12° 50' latitude N.
October 6, 6 a. m.,	138° 50' longitude E.,	13° 10' latitude N.
October 7, 6 a. m.,	134° 35' longitude E.,	13° 35' latitude N.
October 8, 6 a. m.,	131° 10' longitude E.,	15° 10' latitude N.
October 9, 6 a. m.,	130° longitude E.,	18° latitude N.
October 10, 6 a. m.,	129° 25' longitude E.,	24° 10' latitude N.
October 11, 6 a. m.,	130° longitude E.,	27° latitude N.
October 12, 6 a. m.,	137° 10' longitude E.,	29° 30' latitude N.

The second Pacific typhoon was rather small and apparently of no great intensity. It formed probably on the 13th far to the east of San Bernardino Strait near 132° longitude E., 12° latitude N. It moved NW. on the 13th and 14th and N. by W. on the 15th and 16th, filling up probably in the evening or night of the 16th to the east of southern Formosa.

The other two Pacific typhoons existed simultaneously for about four days, after which one of the two dis-

appeared or was absorbed by the other. A typhoon center was shown by our weather maps of the 14th to 15th as forming to the SSE. of Guam near 146° or 147° longitude E. and 8° or 9° latitude N. It moved north-westward from the 16th to the 18th, but inclined westward on the 19th.

On the 18th the other typhoon center appeared on our weather map of 6 a. m. near 130° longitude E. and 15° latitude N. It followed a very abnormal track at the beginning, making a complete loop to the east of southern Luzon from the 18th to the 22d. After the 22d the typhoon took a decided direction to the NNE. and NE. The center passed near the northern Loochoos at noon of the 25th and near the southeastern coast of Japan during the night of the 26th to 27th.

The two typhoon centers were clearly shown in our weather maps on the 18th to 21st; but on the 22d only one center could be distinguished. The approximate positions of the two centers at 6 a. m. from October 15 to 27 were as follows:

First typhoon:

October 15, 6 a. m., $146^{\circ} 30'$ longitude E., $8^{\circ} 25'$ latitude N.
 October 16, 6 a. m., 145° longitude E., 9° latitude N.
 October 17, 6 a. m., $142^{\circ} 05'$ longitude E., $10^{\circ} 50'$ latitude N.
 October 18, 6 a. m., $140^{\circ} 20'$ longitude E., $12^{\circ} 30'$ latitude N.
 October 19, 6 a. m., 140° longitude E., $14^{\circ} 35'$ latitude N.
 October 20, 6 a. m., $136^{\circ} 30'$ longitude E., 16° latitude N.
 October 21, 6 a. m., $134^{\circ} 15'$ longitude E., $15^{\circ} 25'$ latitude N.

Second typhoon:

October 18, 6 a. m., 130° longitude E., 15° latitude N.
 October 19, 6 a. m., $127^{\circ} 50'$ longitude E., $13^{\circ} 20'$ latitude N.
 October 20, 6 a. m., $128^{\circ} 45'$ longitude E., 14° latitude N.
 October 21, 6 a. m., $128^{\circ} 40'$ longitude E., 15° latitude N.
 October 22, 6 a. m., $127^{\circ} 50'$ longitude E., $15^{\circ} 50'$ latitude N.
 October 23, 6 a. m., 127° longitude E., 18° latitude N.
 October 24, 6 a. m., $128^{\circ} 30'$ longitude E., $21^{\circ} 50'$ latitude N.
 October 25, 6 a. m., 130° longitude E., 26° latitude N.
 October 26, 6 a. m., 135° longitude E., $31^{\circ} 10'$ latitude N.
 October 27, 6 a. m., 145° longitude E., 37° latitude N.

On the 9th a small depression or typhoon of apparently little importance was shown on our weather maps over the western part of the China Sea not far from Indo-China. The center entered Indo-China in the early morning of the 10th moving westward.